# nuance

fall 80

"...a shade of difference"

northrop university

## Editor's Note

"The most beautiful experience
we can have is the mysterious.
It is the fundamental emotion
which stands at the cradle
of true art and true science."

Albert Einstein

The Universe begins with more than we can observe.
It begins with what we can imagine — a thought crossing
through the realm of the virtual — and emerging as a measureable discovery.
Each civilization celebrates its own crossing through the unknown
with the maps of Magellan, pyramidal monuments through time, Newton's Laws,
and Einstein's curved space-time continuum.
Each is a celebration of thought transformed into discovery.

To have a belief in the power of the unknown is a great freedom,
a way of participating in the virtual shape of things to come.
**Nuance**, in attempting to build part of Northrop University's future,
is a form of celebration of the crossing of frontiers into the mysterious,
whether it be in space exploration, law practice, religious experience,
or just human understanding.

Michelle O'Daniel
Editor

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Reader Survey

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NUANCE (USPS 478-590) Volume One, Number Four, is published quarterly by the Public Relations Office of Northrop University, Inglewood, California 90306. Second Class postage paid at Inglewood, California. Postmaster: Please send form 3579 to NUANCE, P.O. Box 6001, Inglewood, California 90312
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**How much is the Howard Hughes Estate worth and who owns it?**
**How big is the Summa Corporation? And who owns it?**
**How much estate tax will be levied?**
**Will California or Texas finally get the State Inheritance tax Money?**
**Is there a hidden will, as Hughes himself so often promised?**

These are the questions Attorney Paul Freese has to contend with in one of the longest and most bizarre battles in estate litigation, the battle for the Empire of Howard Hughes.

# Paul Freese — And the Battle For the Howard Hughes Estate

They call it a plain style. Quiet, direct, and unequivocally lethal. The method of Attorney Paul Freese is a perfect antidote to all the courtroom drama surrounding the legacy of the legendary billionaire, Howard Hughes. With a style based on microscopic research and a steel-trap memory, Paul Freese and his scientific coolness have provided the needed touch of balance to the courtroom bravado stirred by a whirlwind of close to 900 claimants over the past 4 years battling for a share of the Hughes Estate. Out of nowhere came alleged adopted sons, sudden illegitimate children, would-be-wives, the infamous Mormon Will, the Howard Hughes Medical Institute, first and second cousins - all eager to prove themselves the righteous inheritors.

As lawyer for the closest living paternal relatives, three cousins of Howard Hughes, Freese must protect the Estate against the claims of all people who go to desperate lengths to get hold of a small fortune.

"From a career standpoint," says Freese, "this Estate litigation is like World War II. I wouldn't want it repeated, but I am glad to have lived through it."

The last great skirmish of the war was the legal battle in Nevada over the authenticity of the Mormon Will found by Melvin Dummar in his gas station in Gabbs, Nevada. Freese spent over a year and a half preparing for the trial which would decide if Melvin Dummar would receive the one-sixteenth of all of Hughes' estate, as the purported will advocated.

The curious character of Melvin Dummar provided a year's worth of courtroom drama that could easily have been confused with a situation comedy. Dummar's story was a great one for entertainment value. It made people wonder -- How could a service station attendant find the lost Howard Hughes wandering in the desert alone? And in return, for giving the old disheveld man a ride to the Desert Inn, where Hughes had lived as a recluse for four years, was it possible for Dummar to receive one-sixteenth of his estate, which would amount to over 100 million dollars, according to the news reports? Why should Melvin Dummar's name appear along with four universities, the Mormon Church, the Boy Scouts, orphans and aides? These are the questions which Melvin Dummar had a hard time explaining.

The newspapers reported the questioning expertise of Freese, which had the court in laughter over the dubious reliability of Dummar:

**"Drama has been one of your interests, hasn't it sir?" asked Freese.**

**"Many years ago it was," Dummar answered.**

**"You had quite a significant role in — of all things — the stage play, YOU CAN'T TAKE IT WITH YOU — is that true?"**

**(Courtroom laughter)**

**"Yes" said Dummar.**

And so it continued with a fairly strong attack on the credibility of Melvin Dummar. Freese refreshed the court's memory with the reminder that Melvin Dummar had hoodwinked people

before. To the shock of the jury, Freese revealed that Dummar had appeared on the game show, LET'S MAKE A DEAL. four times in five years, using alias names.

Looking back over his trial success with all the modesty of the veteran detective, Sherlock Holmes, Freese explained that the real shred of incriminating evidence against the Mormon Will was that the handwriting of the will was based on a later style of writing found in the famous CHESTER AND BILL MEMO, written while Hughes was in the Bahamas, and much publicized in **Life Magazine** and the book, **Hoax**...both readily available to forgers.

**Freese and Co-counsel established that a book at Weber State College library had been mutilated by the removal of pages depicting Hughes' handwriting and that Melvin Dummar's fingerprint was on the book.**

The bulk of the year-long trial in Nevada was taken up with the microscopic analysis of the handwriting of the Mormon Will and its comparison to over four hundred memos handwritten by Hughes.

"Experts came in by the carloads from around the world," said Freese. "There were experts on uremic poisoning to claim the handwriting and spellings were due to illness. Paper Mate ink analysts, fingerprint analysts, and handwriting experts were paid exorbitant sums of sometimes $100,000 for their analysis." The trial was given the dubious honor of being the longest and costliest in Nevada history. The total bill amounted to millions of dollars. The Jury itself cost $14,730 with about $70,000 for the copies of the transcripts of the trial.

But so far the time and research have paid off. Looking up over the rim of his glasses, Paul Freese smiled. "We caught Melvin Dummar in his first big lie by getting him to testify he had never touched the envelope containing the will, when all along we had the FBI's evidence of his fingerprint."

All's fair in forensic war, but it's especially gratifying to know when you win a case out of diligent research and microscopic analysis. "Publicity usually goes to the showman in court cases, but", explained Paul Freese from his 26th floor office in the Kindel & Anderson law offices overlooking the city of Los Angeles, "more often than not this showmanship detracts. It's when you know the facts, what's on page 142, line 5, that helps you impeach a witness and win a case."

And win he did. The Mormon Will was declared a forgery by a unanimous jury, after seven months of court trial. Paul Freese has invested almost five years in the Hughes battle and may invest at least another five. It has become his life's assignment.

Last Will and Testament

I Howard R. Hughes being of sound and disposing mind and memory, not acting under duress, fraud or the undue influence of any person whomsoever, and being a resident of Las Vegas, Nevada, declare that this is to be my last Will and is with all other Wills previously made by me.

After my death my estate is to be devided as follows-

First: one forth of all my assets to go to Hughes Medical Institute of Miami

Second: one eight of assets to be devided among The University of Texas Rice Institute of Technology of Houston — The University of Nevada and The University of Calif

Howard R. Hughes

page one —

By Gary Ebbels
R-J Staff Writer

The Howard Hughes Mormon Will is a forgery.

That was the unanimous verdict of a District Court jury of five men and three women Thursday night after seven months of trial and a day and a half of deliberation.

Los Angeles lawyer Harold Rhoden, proponent of the three-page, handwritten document, said he would not appeal.

"I am not going to appeal because this was a fair trial and the judge did a good job.

"If you have a fair trial, why bother with an appeal?"

**Melvin's dream is shattered**

SALT LAKE CITY (UPI) — Beer truck driver Melvin Dummar's vision of being an overnight millionaire has burst but he still has his dreams.

Dummar was banging out Country and Western music with his band, "The Night Riders," at a church dance Thursday night when a Las Vegas jury declared the Howard Hughes "Mormon will" a fake.

Had it been found genuine, Dummar would be worth $10.6 million as a one-sixteenth beneficiary of the will.

Instead, the 33-year-old former Willard, Utah, gas station attendant is holding onto his truck driving job for a break in the

**FBI expert: Mormon will forgery, poor one**

An FBI handwriting expert testified through his deposition in District Court Thursday the Howard Hughes Mormon will is a forgery and a poor one at that.

The deposition of James Lyle, who could not come to Las Vegas to testify because of an FBI policy against such practices, was read to the jury in courtroom of Judge Hayes.

Lyle, however, using examples of Hughes' handwriting, said the person who penned the Mormon will never even came close to duplicating Hughes' hand.

Attorneys for the contestants were expected to produce live witnesses resuming their case the jury March 29.

PURPORTED WILL — HUGHES EXEMPLARS

HARRIS - LOS ANGELES

Meanwhile, Harold Rhoden, lawyer supporting the legitimacy of the Mormon Will, gave the courts a year of Dummar drama, wrote a flashy book about the gamble for the Hughes Estate and lost the case. Paul Freese, in his typically understated style, only reached

(continued on next page.)

for his children's scrapbook of the news clippings and smiled in the quiet knowledge that he had won the largest part of the battle for the Howard Hughes Estate. The next and possibly the most harrowing episode of the Hughes court saga will be confronting the Howard Hughes Medical Institute's claim that there is a missing or destroyed will which favored their interests. With an enigmatic smile, Paul Freese said "I used to believe he must have left a will, too, until I studied more about Howard Hughes. He was a terrible procrastinator."

After twenty years with the firm of Kindel & Anderson handling all sorts of legal matters, Paul Freese can say "I've finally made it into the Superbowl after struggling through the minor league."

But law practice, time consuming as it is, has not prevented him from serving actively on Northrop University's Board of Trustees, being an adjunct professor at Loyola University, organizing a professional leadership group this year and serving the Constitutional Rights Foundation in efforts to address the problems of rebuilding influences in society which can help the traditional agencies like the family, churches, and schools.

**With an enigmatic smile, Paul Freese said "I used to believe he must have left a will, too, until I studied more about Howard Hughes. He was a terrible procrastinator."**

Surprising as it may seem, he has come all this way through law school at Stanford and twenty years of law practice with a wife, Mary, and family of five children. His oldest son, Paul Jr., having served in the Army and graduated from College, is off with the Maryknoll Missionaries committed to serve three years in the Philippines. His second oldest, a daughter, Mary Jean is in her last year of law school at Loyola. The three youngest are waiting to see what their father does next for inspiration. It will probably have something to do with Japanese since he could hardly wait to whip out his Japanese flash cards and not only speak, but write over 200 characters in a flawless, flowing, natural handwriting... effortlessly. The secret of course, as usual with Paul Freese, is that he makes his success look effortless when he has really spent a lifetime perfecting every technique he knows.

What makes a good lawyer?

"The first thing is diligence, the second thing is more diligence and the third ingredient is care", he says.

Not a bad formula for any successful occupation. nu

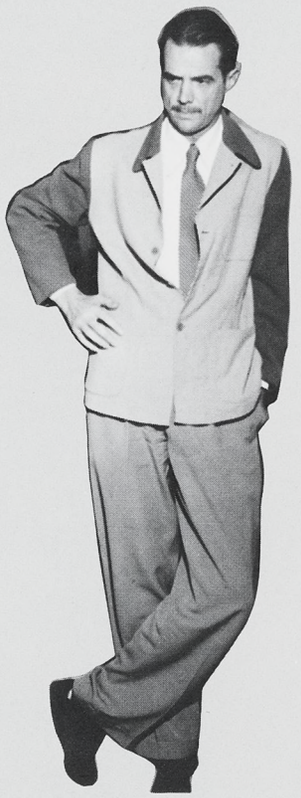
## The Will...

Like the lure of El Dorado, Howard Robard Hughes kept everyone in suspense about the location of his will - promising and then postponing to every nervous aide and employee who asked.

Now after his death, the real search for the secret will, the way to El Dorado, is on. The Howard Hughes Medical Institute in Florida has spent over a million dollars to try to locate evidence to prove there was a will either hidden or destroyed. Psychics have been called in for their leads to the hiding place. Every set of keys has been tried in every possible lock. Old safes and files have been broken open in the hopes of finding the lost promises that Howard Hughes supposedly made to so many people. So far, nothing substantial has been found.

Millions of dollars were spent in the Mormon Will Trial to attempt to prove it the authentic document and not the hoax of a gas station attendant, Melvin Dummar.

The biggest hoax of all may be the one Howard Hughes himself played on his own staff by leaving nothing but a mirage of promises. In the mind of a bed-ridden, helpless codeine addict, who weighed less than 100 pounds at seventy years old, the taunting promise of a generous will may well have been his idea of a bargaining power for more drugs, more time, more life. The man and his legend are so hopelessly entangled that no one will probably



ever know exactly why he kept insisting he had a hidden will, or if he lied, why he kept stalling, postponing its disclosure or if it was his final power play - a macabre joke on all those who served him in the hopes of inheriting a fortune.

Howard Robard Hughes will probably always be a living minefield of conjecture...which might be just what he intended.

## and The Wealth of Howard R. Hughes

Some people say he was the richest man in the world. Sole inheritor of the Hughes Tool Company at the age of eighteen, he went on to become the single shareholder of RKO Studios, TWA, and Hughes Aircraft. As the one-man shareholder, Hughes certainly didn't have to publish annual reports. He chose to live in life-long private session with his proceeds.

Several times, information about transactions hit the news media. In 1966, TWA was sold for a world-record profit of $500 million dollars and Las Vegas was glad to see it coming into real estate, aviation, mining and the gaming operations, casinos and hotels. The rumor was out that Hughes was going to buy Nevada.

Today, the Summa Corporation still owns several casinos in Las Vegas including the Desert Inn, The Sands, The Frontier, and much real estate, plus mining claims in Northern California and the Marina property in Los Angeles.

Hughes Aircraft is owned by the Howard Hughes Medical Research Institute in Florida.

How much the entire Estate is finally worth will be the subject of long court proceedings. Speculation was Hughes' game and now speculation has given him the name of the wealthiest mystery man in United States History.

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## OPPORTUNITIES and REQUIREMENTS

Because of the large number of major ongoing programs, opportunities exist in the following specialties for both experienced and recently degreed candidates.

**ADMINISTRATION:** Candidates with degrees in business with accounting majors, contracts administration, and computer science are selected for openings in procurement, finance, accounting, logistics, product support, contract administration, and computing services.

**AEROMECHANICS:** Perform subsonic, transonic, and supersonic loads analyses for static, dynamic, and flutter characteristics. Develop standard and sonic fatigue loads for analyses and tests. Majors: aeronautical, civil.

**AVIONICS:** Develop automatic testing and fault isolation of avionics equipment pertaining to equipment performance and/or software specifications. Majors: electrical, electronic.

**DESIGN:** Conceptualize new solutions, and coordinate and introduce approved concepts into the manufacturing processes. Majors: mechanical, civil, aeronautical.

**FLIGHT SCIENCES:** Theoretical analyses of general aerodynamic problems in the design of aircraft to predict parameters in performance, stability, and control of aerodynamic loads. Perform heat and power analyses for turbine engines and air-conditioning flow parameters. Perform acoustic analyses. Majors: aeronautical, aerospace, mechanical.

**INFORMATION MANAGEMENT:** State-of-the-art programming for experienced candidates or graduates with appropriate majors and some experience in COBOL, FORTRAN, BAL, and IMS. Business, scientific, software programming and computer operations. IBM 30 33's, 30 31, 168's, and 360 91. Extensive use of distributive data processing units.

**MANUFACTURING:** Determine work and facility requirements; prepare assembly area layouts, manloading studies, and bar charts. Plan, organize, and direct work operations of others in fabrication and assembly operations to control cost and meet schedules and quality requirements. Majors: industrial, manufacturing, engineering technology, management technology.

**MATERIALS AND PROCESSES:** Develop standards and specifications for manufacturing. Test new materials and processes for corrosion prevention and control. Oversee engineering requirements and manufacturing processes. Majors: industrial, materials.

**STRESS:** Perform fatigue and fracture analyses. Develop new technology, perform final static and fatigue tests. Perform material characterizations. Majors: civil, mechanical.

**VALUE AND PRODUCIBILITY:** Review all components and designs for minimum cost and ease of manufacturing. Work closely with design, manufacturing, and procurement. Majors: industrial, mechanical.

**WEIGHTS:** Predict, control, report, and validate mass properties for components and completed aircraft. Optimize components for minimum weight design. Majors: civil, mechanical, aeronautical, aerospace, industrial.

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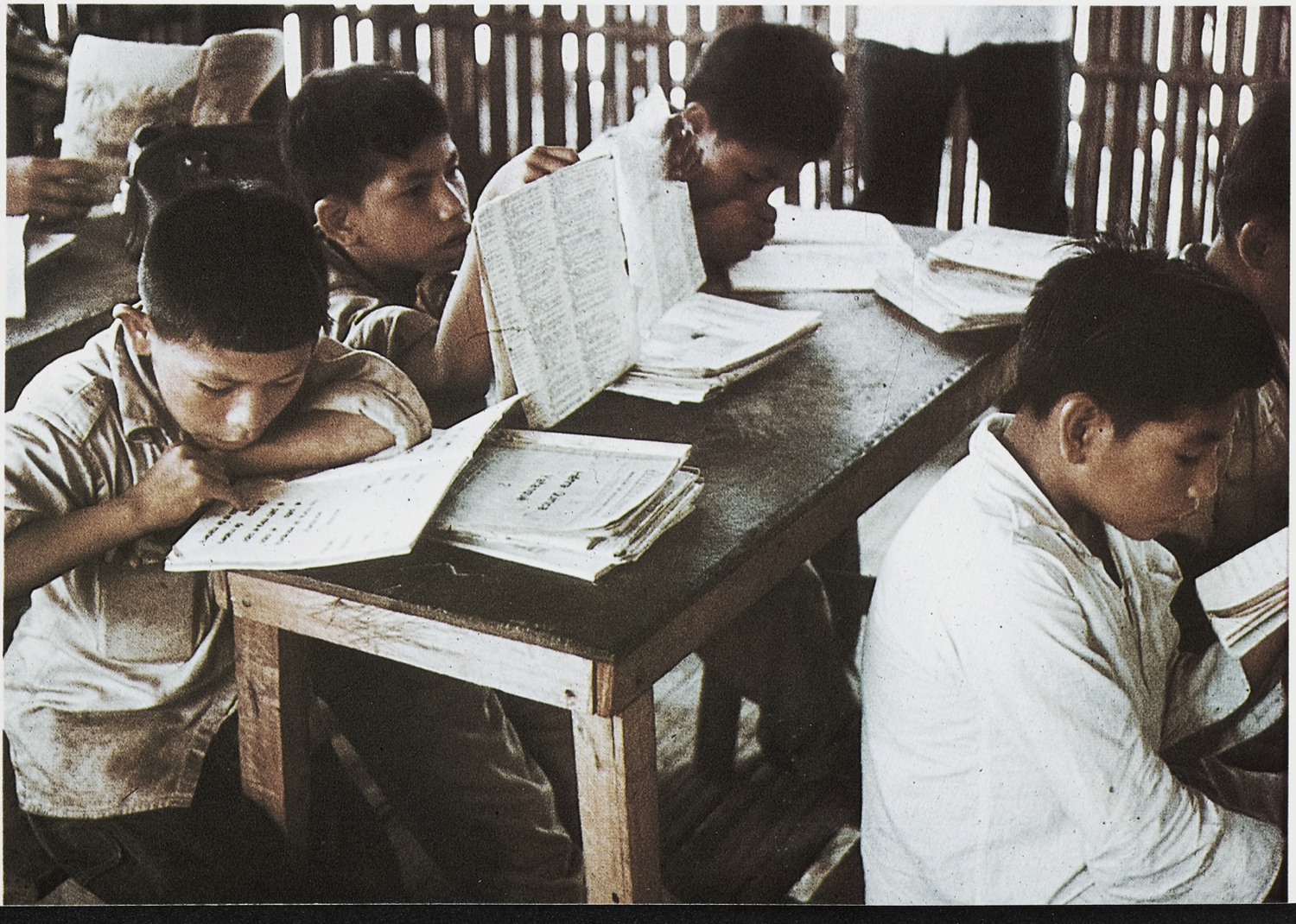
(above) Using the waterways of jungle terrain permits Wycliffe Bible Translators access to tribes which have never before seen a man from the outside world. (below) Another of Wycliffe's roles is to create a written language for pre-literate tribes and teach them to read and write by a basic primer, the New Testament.



When you are a member of an aviator's group like Jungle Aviation and Radio Service (JAARS), one good story just seems to lead to another, and somehow the word travels. Ask Bernie May about himself and it leads to a hundred different tales...about the boa constrictor in the cockpit, the linguist living among killer indians, the rescue of a wounded indian out of the Amazon Jungle.

Out in the bush, each person's life depends on the readiness of another to help. Jungle Aviation and Radio Service is the lifeline into the remote areas of the world where isolated missionaries wait for medical supplies, transportation, and news. No man is an island alone when he works with JAARS and the missionary out-reach program of Wycliffe Bible Translators. They form an intricate network of pilots, technicians, missionaries, and linguists.

Jungle Aviation and Radio Service is the flying arm of Wycliffe Bible Translators, just as the Summer Institute of Linguistics is the academic affiliate which has pioneered the field of descriptive linguistics by sending trained language experts into areas that have no written language where they learn the spoken word and translate it into a written alphabet and grammar. This process sometimes takes twenty years of concentrated study and teaching to create a written language and translate their first text, the New Testament, into that language.

## Bernie May
### U.S. Director, Wycliffe Bible Translators

# Flying to the Ends of the Earth — and Beyond

Bernie May did not fly straight to the top of this complex organization. Since 1956, he has been flying over a million miles of Amazon jungles as a bush pilot charting the unknown regions of Ecuador, Peru and the Amazon of Brazil. One of his first efforts was to fly a DC-3 into Ecuador and start a flight service across the Andes into the Amazon. Now he is the U.S. Director of the Wycliffe Bible Translators, the largest non-denomination mission organization in the world with 4,000 members working in over 25 countries.

"Did you know," asked Bernie, "that there are 2,000 languages which have yet to be written down?"

In the fifty years since the founding of Wycliffe Bible Translators, 750 languages have been translated by dedicated members who receive no salary. Everyone who works with Wycliffe, JAARS, or the Summer Institute of Linguistics goes out and gets his own support base from a church, a family, or individual who will underwrite his expenses. "Right now," continued Bernie, "we have about 35,000 individuals in different organizations who contribute to our support."

Bernie is just getting settled in his Executive Office in Huntington Beach and he looks around the room nervously, shifting his vest into place, "I'm used to flying, being a bush pilot, you know. This job as U.S. Director is new to me but it must be what the Lord has in mind," he reflected. His campfire voice turned mellow and warm as he remembered several experiences which really typify what it means to work with Wycliffe. "I remember flying a young linguist into a remote village in Brazil where the life expectancy was only 26 years," he said. "After she had been out there eight years, the average life span had increased to 58 years old," he smiled.

"And you can't imagine what a shock

(continued on next page.)

**Bernie May**, a graduate of Northrop Institute of Technology in 1956, is now Director of Wycliffe Bible Translators.

it is for some of these stone age people to see a white man for the first time," he added. Then he told the story of the girl who lived with a group of Indians in Ecuador until the down-river relatives, who were known killers came to visit. The linguist called for a flight out and said to Bernie, "Now, Bernie, when you come in here be very, very careful because these down-river people are terribly afraid of white people."

As it turned out, the villagers were literally scared stiff when they saw Bernie get out of his flying machine. "They thought I was a spirit coming out of a flying devil," Bernie whispered.

Another time, Bernie was asked to fly in some building supplies where they were going to build an airstrip. "As we unloaded the wheelbarrow, I realized it was their first look at the wheel," he explained in a wide-eyed disbelief that he had actually introduced the wheel to a pre-historic culture.

Flying in and out among primitive tribes takes a great deal of motivation and courage since jungle aviation is treacherous manuevering among sudden up-drafts, down-drafts, and deadly tropical storms. But when Bernie May was 21 years old, he decided that the life of a businessman was not for him, even though he had been educated in Business at King's College, New York.

It happened quite suddenly and by accident one Sunday at Church that Bernie May and his wife heard a missionary speak about the need for a pilot and secretary in South America. "I had my pilot's license," said Bernie, "and my wife was a secretary, so two weeks later we left for Oklahoma to study linguistics at the Summer Institute of Linguistics."

That Sunday changed their lives forever. Bernie came to Northrop University's Institute of Technology to get more aeronautical training and his Airframe and Powerplant license. From there in 1955, he went to the interior of Brazil where he lived for several years in the Amazon raising a family of his own of three boys and flying the necessary rescue and supply missions.

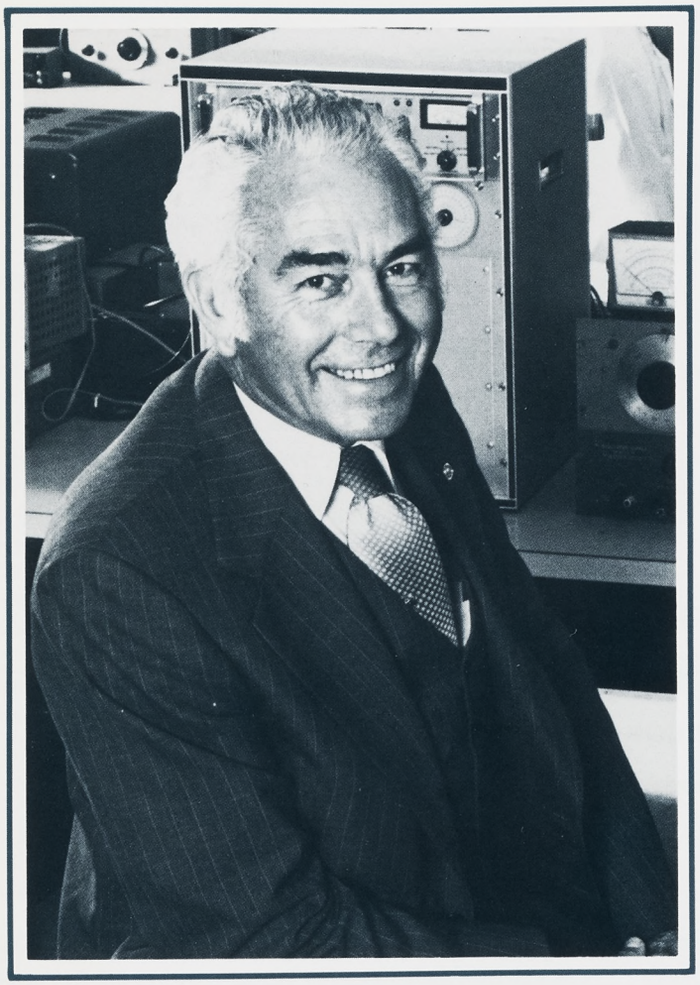
"I'm not a preacher-type, but I know how I have been inspired by the people who have gone into the interior of remote countries and helped to lengthen the natives' lives and give them hope. I remember that I flew translators into villages where people had no concept of a pencil. This is only back in 1956. I flew two young girls into a village in the Amazon where I remember thinking, "What are these girls going to do out here with these savages?"

(above)Many tribes, worldwide, now depend on JAARS and Wycliffe for medical supplies, (below)and transportation out of isolated areas.

"The worst thing about the village was the children. They wore no clothes and they were covered with dirt. I couldn't bear to look at their faces. Then a few years ago, when I was in Peru for a business conference I met a young Indian gentleman who introduced himself as a member of the Taparuk, that same tribe where I had left the linguists about 20 years earlier. He said he was now their Director of Education and that there were 65 members of his tribe in Taparuk who had entered the teacher's training school that year!"

The linguists had done their job translating an oral language into a written form and teaching the natives how to read and write. It had taken them 20 years and they had remained until it was accomplished!

Bernie looked up from behind his wide-rimmed glasses that give him an owl-eyed expression, "I said to myself then," he recalled, "to me that's motivation. That's why I do what I do." nu



## Who's afraid of the DC-10 ?

Leon Daugherty, former Director, Western Region, FAA and now Dean of the College of Technology at Northrop University, personally delivered the FAA ORDER TO SUSPEND ALL DC-10 flights in the United States to the President of McDonnell Douglas on June 6, 1979 at 03:48 in the morning.

Leon Daugherty's 33 years experience with the FAA, combined with the substantial report by the House of Representatives special Sub-Committee on investigation into Air Safety provided the information for this report on the development of flight safety procedures and instrumentation.

# The Cummulative Causes of One Aircraft Disaster

Isolating the causes behind aircraft disasters is like trying to separate grains of sand from a concrete mixture. Everyone in aviation feels an integral sense of responsibility and loss for any air tragedy. It becomes painstakingly difficult to determine precise contributing causes, but it is most necessary to the further development of safety features in air transportation.

On May 25, 1979 American Airlines Flight 191 was taking off from Chicago O'Hare International Airport with its nose rising for lift off when the left pylon and engine tore loose from the wing, passed over it and fell to the runway below.

At the rotation point, the cockpit voice recorder indicates the DC—10 flight deck crewmembers called out "Vr (pause) damn." That was the last ever heard from Flight 191. In the worst air crash in the United States, all 272 passengers aboard were killed as the plane hit and exploded on impact. The voice recorder went dead when one of the electrical systems was wrenched away with the number one engine...so no one knows precisely what the pilot thought.

The Federal Aviation Agency, the National Transportation Safety Board, members of the Pilot's Union, American Airlines and McDonnell Douglas,(the DC—10 manufacturer), all came together in Chicago to determine what really happened to Flight 191.

What intrigued everyone was why the aircraft did not remain airworthy despite the loss of one engine. Pilots were trained to fly on two engines and the aircraft had been flight-tested with one engine inoperative. Why did the plane attain an altitude of 600 feet before it veered sharply to the left, went into a roll, and crashed? (continued on next page)

**Cummulative Causes** continued

When Elwood Driver, Vice-Chairman of the NTSB held up a tiny broken bolt found near the runway and suggested that it might have broken from metal fatigue, the press immediately seized the broken bolt as THE CAUSE of the accident. Cartoons were published showing how only a few bolts held an entire engine and pylon to the wing.

Overnight an indignant general public demanded to know how an airplane could be held aloft by a bolt three-eighths of an inch thick.

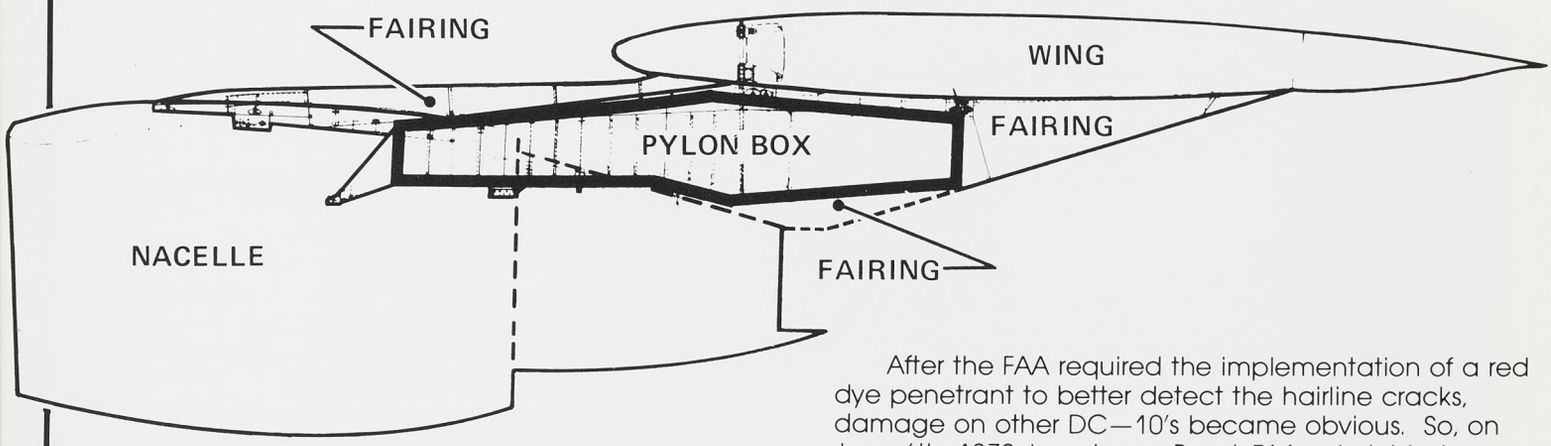
Understandably, the aviation industry was upset at the simplification, since the pylon and engine are really held by two bulkheads attached at four points by different bearings, bushings, bolts and thrust links.

If fatigue had truly caused the smaller bolt to crack, this would indicate that the structural design of the DC—10's engine mount could be of questionable safety design: **see illustration below**

From all of his indicators and his training, the pilot instinctively decided to increase his altitude to gain time, not realizing that when he traded air speed for altitude, the left wing would go into a stall. When the plane slowed down to climb to 600 feet, the left wing stalled and tipped downward, causing the plane to go into the fatal roll.

The DC—10 crash at the O'Hare Airport caused an intensive investigation into the cummulative causes that led up to the loss of aircraft control at 600 feet. One of the first actions taken by the investigative team of the NTSB was the recommendation that the FAA issue an emergency airworthiness directive (AD) to inspect all pylon attach points on all DC—10's in the United States.

United Airlines discovered "serious damage" on several of their DC—10's and decided to ground it's entire fleet of 37 untill they understood more about its reasons. Caution was becoming the all-important by-word.




But, as lab tests showed, the bolt had been severed by external forces. The search was on to determine how the cracks had been inflicted in strategic areas.

According to the National Transportation Safety Board's final report, examination of the separated pylon showed there had been a pre-existing 10-inch crack in the forward flange of the pylon's aft bulkhead. The crack was determined to have been produced during maintenance when the pylon and engine were removed together by a forklift "hoister" contrary to recommendations for maintenance as specified by McDonnell Douglas. Later research showed McDonnell Douglas had not made formal protest...

Safety Board findings also showed that separation of the pylon from the wing had damaged hydraulic and flight control components. The all-important stall indicator had been ripped out with the 3rd hydraulics system of the engine, otherwise, the pilot would have known the left wing was not flying. But from the cockpit, the pilot had no way of knowing that he had lost an engine, nor that the slats had retracted, making it impossible for the wing to fly at posted minimal air speed.

After the FAA required the implementation of a red dye penetrant to better detect the hairline cracks, damage on other DC—10's became obvious. So, on June 6th, 1979, Langhorne Bond, FAA administrator, decided to ground all domestic DC—10's until it could be determined whether the cracks were due to stress and fatigue, or from other causes.

The investigation was turning up additional long-term, contributing causes to the American Airlines disaster. Months previously, Continental Airlines had discovered that hoister maintenance procedures were damaging bulkheads. They reported this to the manufacturer, McDonnel Douglas, and requested advice. Douglas had issued an Operational Occurences report on January 6th which informed other DC—10 operators of the problem,but the FAA never received a copy of the Continental incident.

Since the ill-fated DC-10 that crashed in May had been overhauled in April, any alert to the dangerous maintenance procedures then in practice might have altered the circumstances which allowed a 10-inch crack to develop on the bulkhead of the plane. Again, another cummulative factor to the air disaster was identified.

Meanwhile, within a week of the crash, the FAA took about 50 DC—10 airline pilots into a computerized simulation of Flight 191 to see how they would have handled the aircraft. Only ONE PILOT SUCCESSFULLY FLEW OUT OF IT.

Then, the flight simulators were re-programmed to include a stall warning indicator on both wings and all the next 50 pilots, when tested in the simulators, lowered the nose of the aircraft, increased speed and successfully flew out of the situation with no additional training or procedure change.

So another causal factor came into play. If the aircraft had been equipped with a backup stall-warning device for the damaged wing, the pilot would have known he must lower the nose and maintain airspeed to be able to circle and land.

As a result of the accident's investigation, no DC-10's engine is now removed with a forklift. The FAA issued three Airworthiness Directives. One specifically required the improvement of the wing slat mechanical drive systems. And all wing mounted pylons on the McDonnell Douglas DC-10's now undergo a more rigorous inspection because previous inspection procedures were not found adequate to the safety need.

The third directive required a duality of the sensing systems related to the control of flight of DC—10's. This directive was issued to insure that the wing slat sensing system and the stall warning systme keep the flight crew informed of any potentially hazardous assymetric slat conditions with enough warning time to correct it. This system of dual stall warning on both the right and left wings was installed on all DC—10 wide body jets before they returned to flight status.

With these corrective measures enacted, the DC—10's were returned to service after 38 days on the ground.

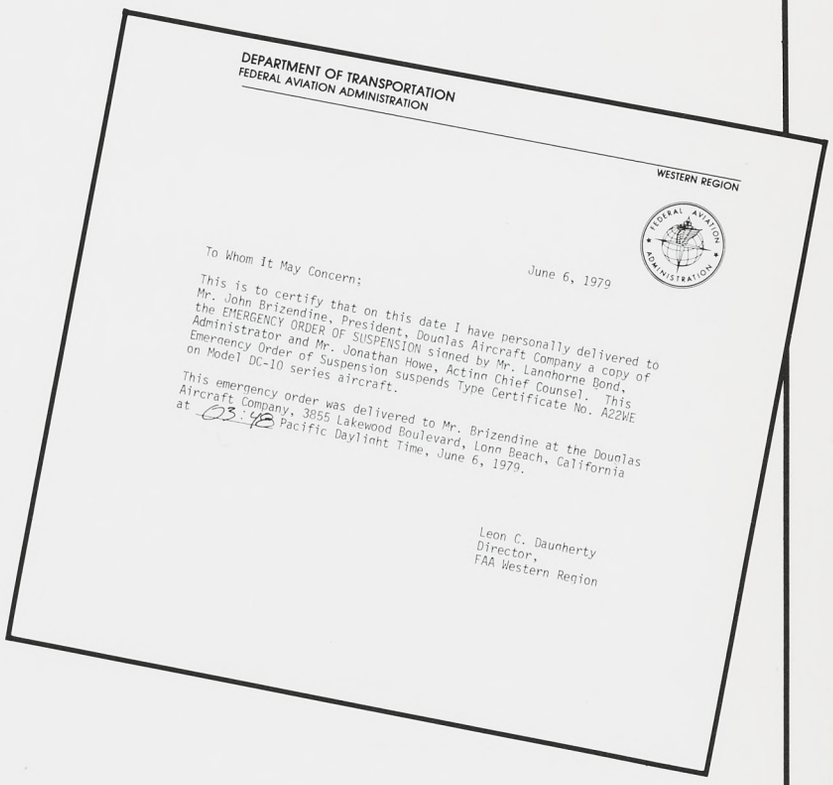
The question arises, as it always does in hindsight : "Had the plane been equipped with a back-up stall-warning device, or had the maintenance procedures been adequate, could the disaster have been averted?"

The answer probably has to do with Murphy's Law and human error. As of yet, there is no fail-safe, man-made, man-operated machine. Mistakes, miscalculations are still inherent in any human system, but statistically air travel presents far less casualties than automobile travel.

In the year 1978 (the year of the San Diego mid-air collision), 162 people were killed in commercial air travel accidents nationwide, while in the same year in California alone, 4,000 people were killed in car accidents.

However, given the potential magnitude of one air disaster, public attention is understandably riveted to each incident. As a result of the concern, the FAA, a Special Investigative Subcommittee on Air Safety, the McDonnell Douglas Corporation, the National Transportation Safety Board, and the Air Force Aeronautical Systems Division all participated in studies to determine what requirements were needed to prevent any similar accident.

The FAA, after a six month study declared the DC-10 pylon "fundamentally sound with a design life equivalent to approximately 25 years." They banned maintenance by forklift and ordered replacement of certain titanium parts with stronger steel parts to give a projected useful life of 90,000 flight hours.



DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WESTERN REGION

To Whom It May Concern; June 6, 1979

This is to certify that on this date I have personally delivered to Mr. John Brizendine, President, Douglas Aircraft Company a copy of the EMERGENCY ORDER OF SUSPENSION signed by Mr. Lannhorne Bond, Administrator and Mr. Jonathan Howe, Actinn Chief Counsel. This Emergency Order of Suspension suspends Type Certificate No. A22WE on Model DC-10 series aircraft.

This emergency order was delivered to Mr. Brizendine at the Douglas Aircraft Company, 3855 Lakewood Boulevard, Lonn Beach, California at 03:48 Pacific Daylinht Time, June 6, 1979.

Leon C. Daunherty
Director,
FAA Western Region

The National Transportation Safety Board required the airlines to report to the FAA details of any incident involving structural damage — regardless of how it occured and requiring that damage reports be evaluated by the FAA for unsafe practices. The relevant safety information was ordered to be distributed to other operators and maintenance facilities. This emphasized the need for swift and accurate communication within the aviation industry and the regulatory commissions.

The research by all involved led to the conclusion that it was the particular cummulative effects of the events which led to the crash of the DC—10. "Each by itself would not have been enough to cause a qualified flightcrew to lose contol of its aircraft." But at a critical point, the crew was left with "an inadequate opportunity to recognize and prevent the stall." (NTSB, Friday, December 20, 1979 News Release)

Flight Safety consciousness has now been raised to insure increased surveillance and reporting systems so that the margin of human error can be reduced still further.

After the grounding of the DC—10's and the subsequent investigations, the flight industry recognized that their future depends on public confidence in the safety controls to provide as near a fail-safe mechanism as human engineering permits. nu

They made front page headlines in Venezuela as aviators who challenged the Bermuda Triangle, the gas pirates, and the open seas in a single engine Grumman... and made it safely home.

At twenty years old, Mike Marko and Pedro Jose Benevides, both in the Aviation Technician School at Northrop University, flew 3,600 miles from Los Angeles to Miami — through the dark Bermuda Triangle — to Venezuela in a single engine Grumman AA5. Looking back over the three day journey, Mike Marko recalled the ups and downs of the island crossing.

# Island Crossing

by Mike Marko

I had never been off the North American continent before, but my co-pilot, Pedro, was a native Venezuelan and I figured he could talk our way out of anything if we could fly through it. We both have commercial pilot's licenses with single and multi-engine, land and instrument rating with about 1200 hours of flight time each. So, I figured we could fly our way out of anything reasonable. But, just in case, we stocked the Grumman Traveler with 2 radio sets and a life raft loaded with provisions. I had my camera ready to document the slow sinking of our ship...just in case we ran into engine trouble over open seas.

Although the single engine Grumman is capable of 400 nautical miles at about 110 knots between fueling stops, the Bermuda Triangle has been known to effect the instruments' functioning and we were alert for possible mis-direction. We kept watch with the compass, the clock and the stars.

Beginning the trip was easy. We waved good-by to Van Nuys, California just like we always took 1200 mile trips in a single engine plane. After 24 hours of straight flying with 6 stops only for refueling, we arrived at Miami's Opa Locka Airport, two very sleepy pilots. 24 hours, we learned, is a considerable time to be in the air even if you alternate taking the controls and sleeping.

It took us a long days rest to get up the courage to fly out into the Bermuda Triangle, but on June 19, at 3:30 a.m. in the dark of morning, we left for as far as we could go. Unfortunately, when you are limited in range to 400 nautical miles, you must keep your eyes open for islands.

2.

3.

4.

We didn't think about what it would be like treading water and we agreed never to mention sharks. But in 45 hours of flight time, you do run through just how easy its going to be if you have to set the plane down on water, crawl out, inflate the raft, set up the radio distress calls, and calmly wait to be rescued. That part does recur in the mind's emergency broadcasting system constantly. I must have imagined my smooth-as-silk water landing at least every couple of hours just so I'd be used to it if I had (luck failing) 'to ditch.'

Flying south of the Bahama Islands our instruments began to malfunction. We could plainly see an island called Deadman's Cay below -- while our instruments showed us 80 miles to the West. Other than that the infamous Bermuda Triangle was relatively calm. As soon as we got out of the area, our instruments returned to normal.

Had we totally obeyed our navigation instruments, we would most likely have entered Cuban Airspace and generated a whole new set of problems.

Island hopping across the Caribbean is a dangerous sport -- considering the gas pirates who hold your plane for ransom until you agree to pay their prices for fuel.

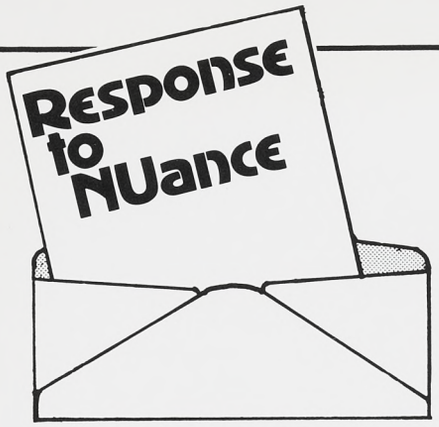
The God-forsaken rock named Great Inagua is one of those questionable re-fueling stations. We landed only because we were forced to by the look of the fuel gauge. The island looked deserted except for the thousands of mosquitos. You can literally be eaten alive by bugs on these rocky, lifeless islands. The insects are eager for anything warm and breathing.

After finding our way into what they called 'the town,' we were told the fuel pump was inoperative. It was being painted. It took us four hours to talk the chief gas rationer into filling our tanks. I should mention that in the Bermuda Triangle, which we were in, the people claim they can do magic at will. The attendant successfully pumped 24 gallons into each of our 17 gallon fuel tanks, at the rate of $2.60 per gallon. After a brief argument, we settled on a more believable 20 gallons per tank at the going extortion rate -- and taxied out of the Great Inagua forever.

After landing at our destination on the south Caribbean resort island of Aruba, we were so relieved to have made it that we were numb when the custom officials prodded, poked, and stripped the lining of our luggage searching for hidden panels and contraband.

We had survived the island crossing, the gas pirates, the Bermuda Triangle and the killer fatigue of flying 3600 kilometers in a single engine plane. It took me two weeks to get the courage and the energy to leave Venezuela and my co-pilot, Pedro, and to fly back -- across the islands to Miami for 22 hours -- alone.

**1.** Northern reaches of Venezuelan jungles where tropical birds fill the air with their calls. **2.** Thunderstorms are things to avoid in light aircraft. Here Mike zig-zags his way north of the Caicos Islands, northbound to Nassau, Bahamas. **3.** Mike Marko's Grumman framed by a vivid Venezuelan sunset. **4.** High pinnacles obscured by clouds in this landscape that defies intrusion in Canayma, Venezuela.




I have just received a copy of the Summer 1980 edition of **Nuance** "a shade of difference" and just wanted to let you know that I think it is an excellent magazine. I would appreciate it very much if you would put me on your mailing list to receive future copies. The one I have was addressed simply to Director of Personnel, Mallinckrodt, Inc.,,etc. We have three Directors of Personnel, so thought I would ask for this in a more personalized manner.

Again, keep up the good work and I look forward to receiving your next quarterly issue.

Victor B. Marcussen
Director of Personnel
Mallinckrodt, Inc.
St. Louis, MO

## Future Art

I enjoyed the Summer 80 copy of **Nuance**, especially the art and photos of outer space. I would like to get copies of Ron Russell's art. Would you please tell me how I may obtain them. I also, would like to purchase photos of outer space from JPL. Please provide their address for this purpose. Thank you.

Ed Brennison
Oxford, CT

**Note:** You may write Ron Russell directly for his color brochure of space-art paintings and prints at:

Ron Russell
Glass Art Prints
P.O. Box 1351
Sonoma, California 95476

The best place to purchase NASA space photos is:

Space Art
178 C avenue
Coronado, California 92118
Send $1 for 40 image color folder.

## Merci Beaucoup!

It was a pleasure meeting with the Nuance staff and being able to share with you in person my pride in the new Northrop quarterly. You (plural) are doing much to mold the new image which melds technological excellence with prestige in a broader sense.

Carol Benson
Safety & Missle support Systems
Hughes Aircraft Company
Los Angeles, CA

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Thank you so very much for the copies of **Nuance** magazine that you sent me with the article about me in it. My wife and I were really thrilled with the wonderful job you did in reporting my life experiences and accomplishments. It was very well written and most enjoyable. Thank you for a superb job!

An interesting sidelight to the article was that an old friend and former classmate from Northrop who is now working at Hughes contacted me after having read the article. It was a great pleasure to be in touch with him again.

I believe that your treatment of **Nuance** has put the school in a very favorable light and has raised the school to a new level of visibility and influence.

Kitaw Ejigu
JPL,Poject Engineer
Systems Design and Engineering
Pasadena, CA

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Thank you for sending me the summer 80 issue of **Nuance**. The magazine is most impressive. I enjoyed the several informative articles.

Billy G. Mills
Supervising Judge
Family Law
Superior Court
Los Angeles, CA

## We Found You!

The implementation of **Nuance** is a definite asset to N.U. and valuable to the Alumni.

As an Alumnus, I would like to read about retired Administration, Faculty, and Staff at Northrop University. For example: Dr. John K. Northrop, Dr. James McKinley, and C.T. Reid (very active in Alumni and Student Affairs during the late 50's and early 60's.)

And I would like to request another copy of the Winter 1979 **Nuance** as I gave my copy today to Lake County Area Vocational Technical Center, in the hope of attracting good technical, business administration, and law students to Northrop University in the near future.

Clyde S. Burlhardt
A.E.T. '55, B.S.A.E. '59
past Alumni President
Northrop Aeronautical Institute

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I am honored by your invitation to contribute to the write-up in **Nuance** about the 50's and 60's; also to tell of my own treasured experiences with Northrop Institute of Technology. How I would have enjoyed receiving this opportunity 10 or 12 years ago in the early days of my retirement! I have always enjoyed writing and particularly writing about the Northrop school. But in a few weeks I'll be 79 years old and with the very real possibility of more vital physical struggle just around the corner, I must sadly decline.

Please convey my personal greetings to Jim McKinley and Jack Northrop.

Yours for a great future for Northrop University.

Dr. Charles "Tom" Reid
Tucson, AZ

## One More Time

The Women's Week Committee of the Rocketdyne Division of Rockwell International wishes to thank you for your assistance in obtaining copies of the article, **Women in High Tech**, which appeared in the Spring 1980 issue of **Nuance**.

We certainly appreciate your generosity and thoughtfulness in our behalf. Thank you again for your help.

Linda Krise
Coordinator
Women's Week Committee
Rockedyne
Canoga Park, CA

This is to confirm our June telecon in which I requested permission to reprint 600 copies of the Dr. William Ballhaus article entitled **What is Killing the american Economy** from the spring issue of **Nuance**.

Don Cook
Beech Aircraft Corporation
Wichita, KS

This letter confirms my verbal request to reprint the article by Carol Benson, **Safety VS. Energy**, which appeared in your summer 80 **Nuance** publication.

Thank you for your consideration and permission to reprint.

David E. Galas
Systems Safety Society
Rancho Palos Verdes, CA

P.S. We are interested in considering any student paper on a safety related subject for publication.

## Reader — Writer

This letter is in response to the essay, **Safety Versus Energy**, in the Summer 1980 issue of the Northrop University **Nuance**.

As a loyal alumni of Northrop University, I would like to know if you would consider accepting for publication in the Northrop University **Nuance** a short article that provides a different perspective on the subject of safety versus energy.

As a relative newcomer to the nuclear energy industry (after 25 years in the aerospace industry), I am appalled at the distortions, errors and even deliberate fallacies in the information presented about nuclear energy in the news media. Questions and controversy are both beneficial and commendable, but distortions of fact or logic ——whether the result of ignorance or intent——are neither beneficial nor commendable.

Allen G. Barclay
A.E.T.'47
San Jose, CA

**Note:** **Nuance** welcomes articles expecially if they are in your field of expertise. However, all articles should be typewritten and will be edited according to **Nuance** standards should the article be accepted by the editorial staff.

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## R.S.V.P.

**Nuance wants to know your impressions. Address your responses to Editor, Nuance, Northrop University, Inglewood California 90306.**

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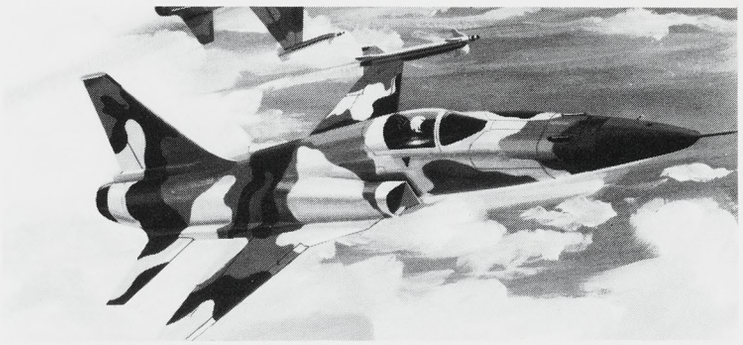
The World Globe October, 1980



# NEWEST NORTHROP FIGHTER ADVANCES F-5 FAMILY

### March 24, 1980 - Hawthorne, California

The new generation of Northrop's F-5 family of low cost tactical fighter aircraft, the F-5G, was announced at Hawthorne today, stepping up a nearly 20-year evolutionary program for the company. The single-engined F-5G was conceived to meet world defense needs today and through the 1990's, and offers an affordable, supportable defensive system that keeps pace with the changing requirements for national security.

### October, 1980

Northrop Aircraft is still designing and building high-performance aircraft today in the company's mile-long, modern complex in Hawthorne, California. For 40 years, we've promoted the people associated with our products and furnished one of the finest benefits packages available in the industry including educational reimbursement for employees in an accredited graduate study program; a convenient savings plan - for every dollar invested, Northrop contributes 50 percent; and generous vacations - including a week long Christmas holiday. In addition to a creative work environment you'll enjoy Southern California's year round recreational paradise. And, Northrop's recreation club sponsors many enjoyable activities such as skiing, golf and fishing.

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**Aircraft Division**

# NORTHROP

**Making advanced technology work.**

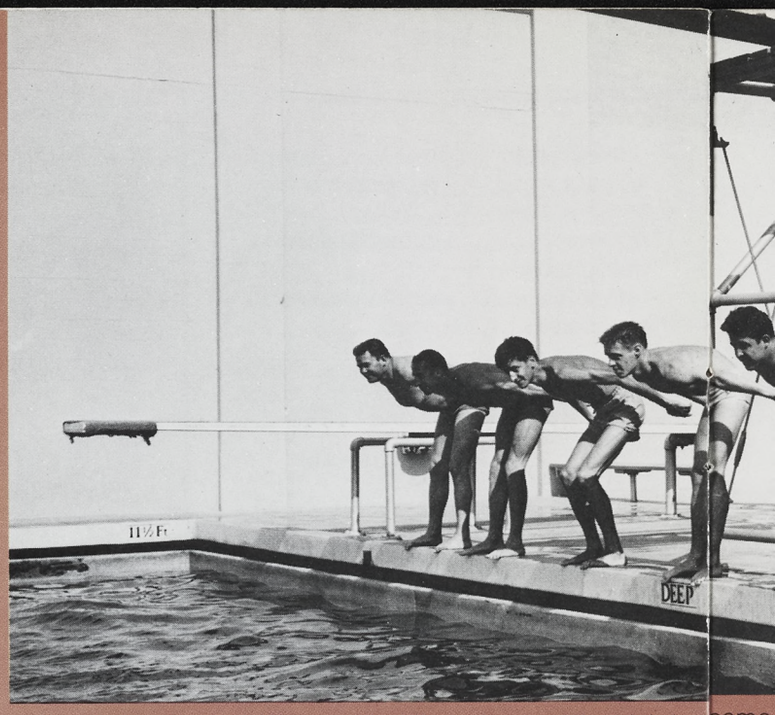
# The Growing Years of Northrop University 1950 to 1959

As the decade began, Americans found themselves, again, engaged in a shooting war on the far side of the pacific. In June 1950, with frightening suddeness, North Korean forces plunged across the thinly defended border that separated them from the Republic of Korea. Although the impact on the aviation industry was not as critical as that of World War II, many of the nation's aircraft manufacturers were called upon to produce more sophisticated aircraft that would enhance the military position of South Korean fighting forces. Additionally, several of the country's airlines negotiated contract arrangements to coordinate the "Berlin Airlift" operation to transport military cargo and personnel.

Companies such as Pan Am and Western were among the first to take advantage of the opportunity to develop international trade routes and secure themselves financially amidst rumors of economic recession that darkened the nation's forecast.

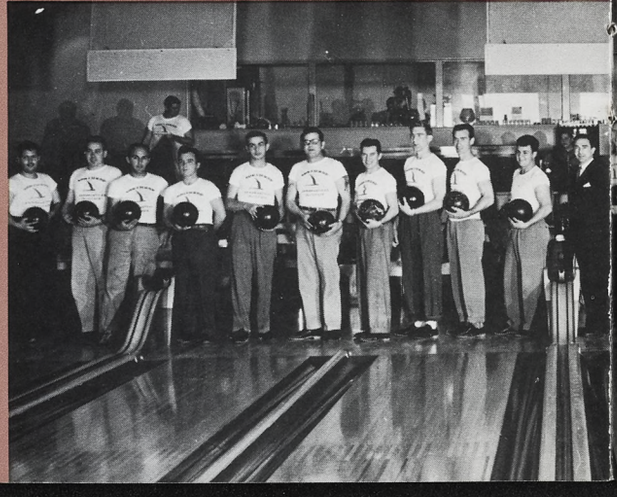
These predictions reflected the aviation industry's "stable" and "conservative" growth pattern. However, this era noted the blossoming of the small executive type aircraft. The light plane industry was pleased that the anticipated desire of the ordinary citizen to fly seemed to be a fact and that the dream of mass market was coming true. Before long, agressive airline leadership began to demand the government regulate small planes to keep them out of "their" airspace, forbid them to use "their" instrument approach facilities and keep them out of "their" demands.

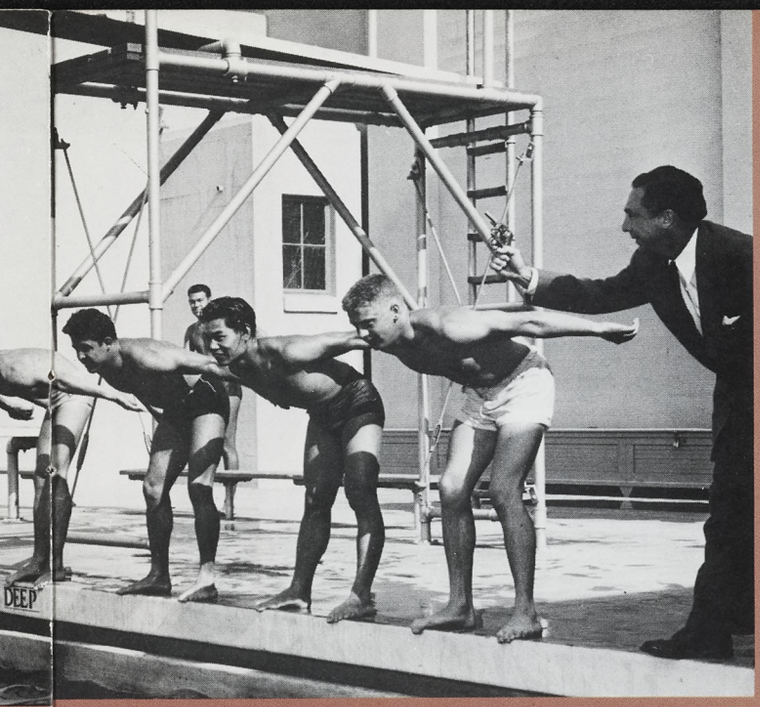
Unlike the late forties which witnessed thousands of trade and vocational schools springing up to capitalize on recently discharged veterans who took advantage of the new V.A. benefits, the student market had bottomed out and these same schools were faced with declining enrollments and closures. Northrop University was not immune to the national scene. In a drastic budget cutback, "Department 95" of Northrop Aircraft, otherwise known as Northrop Aeronautical Institute, was ordered to be phased out. Through this severing of an academic and financial relationship, James McKinley the President of the Institute at the time, and Herbert Hartley realized that continuation of the school must be through an entrepeneur relationship.




**The Active Student Life** provided the school spirit which has come (shown above in suit & tie) was a familiar face to Northrop students dedication to the school spanned a career of over 20 years.

McKinley recalls, "I remember they told us that they had to cut us out because they had no more government contract to keep the operation going. So Herb and I made them an offer to buy the school lock, stock and barrel. I called up the Chairman of the Board of Northrop Corporation and basically told him I'd pay him a dollar down...a dollar next week...and a dollar when you catch me!"





come to be regarded as the "Northrop Tradition". Floyd Smith, tudents and has recently retired from the Northrop Family. His

"Our ultimate goal," he continued, "was to establish Northrop as a non-profit institution. I've never felt good about education for profit. So we set about scouting property and facilities for our school. We heard that competitor school, The California Flyers was going bankrupt and were being forced to close. Although we were not in as bad of shape, times were pretty slim everywhere. So we merged at the Inglewood location which has proved home for Northrop's A & P school ever since."

Historically, aviation has experienced dramatic changes, revolutionary breakthroughs, and courageous leadership, yet this period of the mid fifties reflects a surprisingly tranquil period of aviation growth. Researching the era, one is quick to observe that those years are regarded most fondly with reflective thoughts.

**" Intellectually, I know that American is no better than any other country; emotionally, I know she is better than every other country. "**

**Sinclair Lewis, 1951**

It was a time when a student would labor weeks over customizing his tool box to be ready for the "first" day of class and casually flaunt his labor of love - and however many months of allowance - quite effortlessly. A time where lunch period in the student parking lot was an "event" to witness the latest changes in car customizing. polishing techniques and everything you always wanted to know about rebuilt engines.

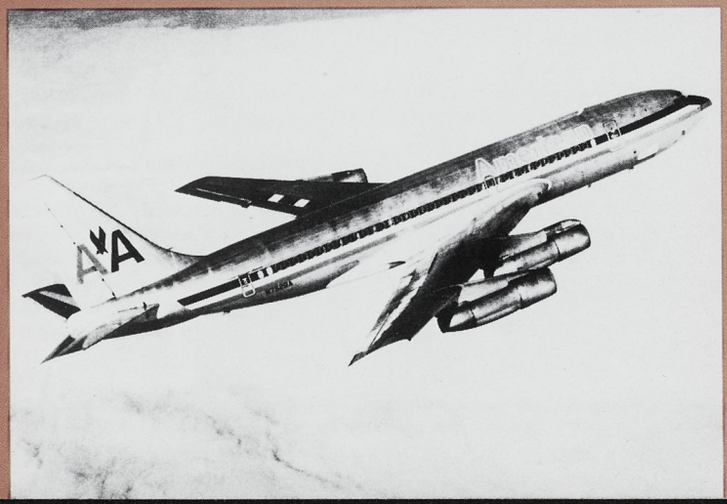
Recognizing that program and curriculum development was needed to effectively compete in the progressive aviation industry McKinley and Hartley developed engineering programs to balance the mechanical skill and expertise so badly needed to keep the increasing number of private and commercial airplanes in the air.

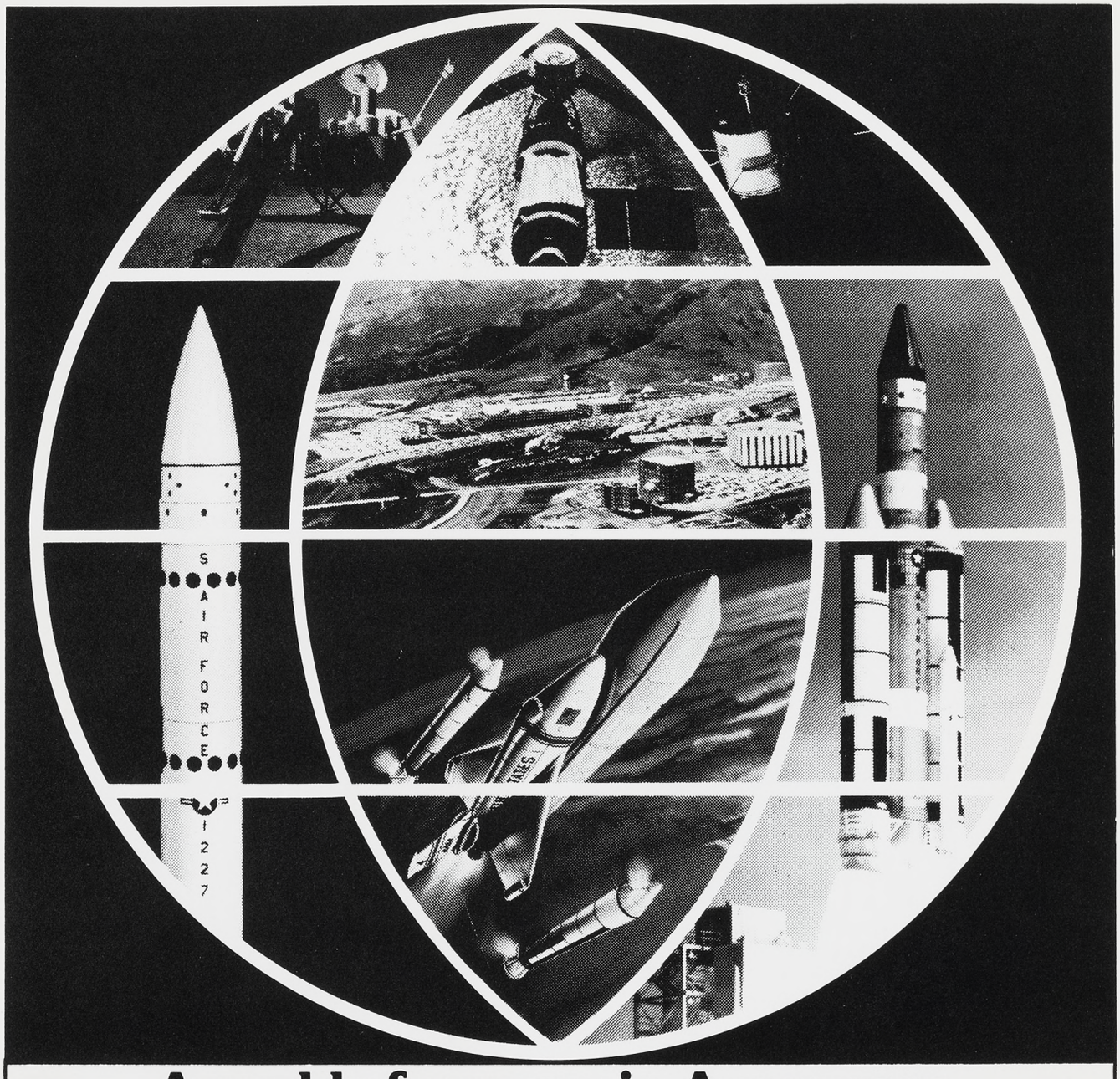
Much of the physical development of the campus occured during this period as McKinley and Hartley jointly donated the funds necessary to establish Northrop Hall of Engineering. Today, the structure, renamed the Student Center, houses many of the student groups and organizations as well as the Campus Bookstore.

Additionally, their continued expansion plan called out for seeking industry and community leaders to assist in the construction of McKinley Residence Hall which still today is running at full capacity and is a main source of on-campus housing for students.

McKinley and Hartley's predictions of industry turnaround proved well founded as the pendulum swing of success unveiled itself in the form of a Boeing 707 jetliner that proved to revoluntionize air travel. American Airlines, in 1959 was the first major airline to adopt the use of the new fuel and cost efficient aircraft.

Through the insight of Northrop University administrators, many of the graduates were prepared to meet the challenges set forth by the fifties. The jet had added a new "adventure" to aviation and the Northrop tradition carried on.



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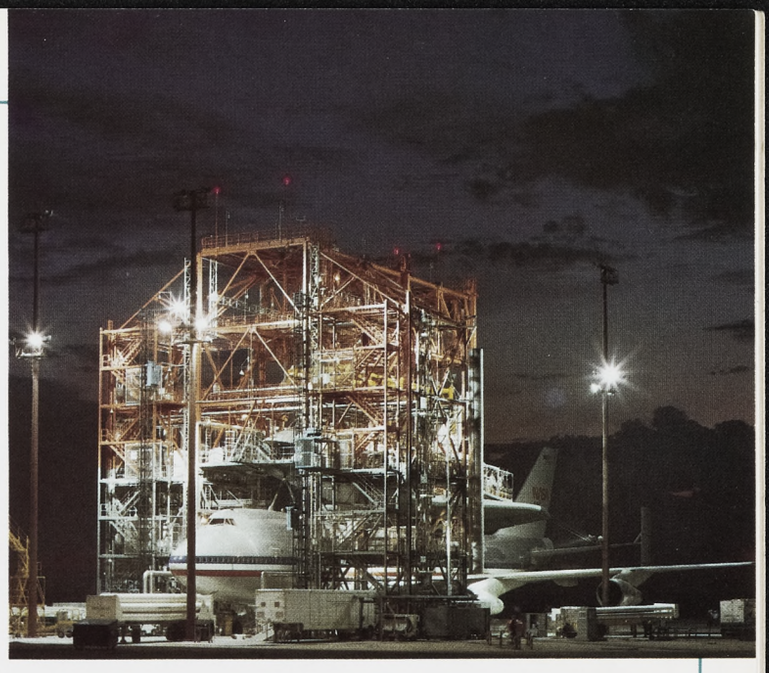
# Northrop U. Boards Space Shuttle "Enterprise"



It's all still in the planning stage, but when NASA's Space shuttle is ready to orbit the Earth with its experimental payload, part of Northrop Universtiy will be orbiting with it in a 100-pound cannister.

That's because Northrop University has been selected by the Los Angeles section of the American Institute of Aeronautics and Astronautics to receive a $5,000 grant for the purchase of space aboard the NASA Space Shuttle in 1982.

**Northrop University's Engineering Students are participating in this venture in the program NUSTART. (Northrop University Research Team) and its members are constructing a sophisticated materials-processing experiment scheduled to fly aboard the shuttle into Earth's orbit.**

In January 1980, Emile Barchichat, an Aerospace Engineering graduate and now a lieutenant in the U.S. Air Force, and Arif Dhanidina, a senior in Aerospace Engineering, were awarded first prize in the A.I.A.A. Los Angeles Section Student competition for their findings and experiment.

In April, they were invited to deliver a technical paper on the progress of their work to the A.I.A.A. at the Salt Lake City Western Regional Conference.

Their experiment is designed to find the special properties of metals foamed in space. By taking a metal into space, melting it and injecting it with inert gas bubbles at zero gravity, they will form a super-metal which they will test to measure its strength per pound and its potential usage for metal construction in space. Projected use for the metal includes the manufacturing of solar power satellites and space stations.

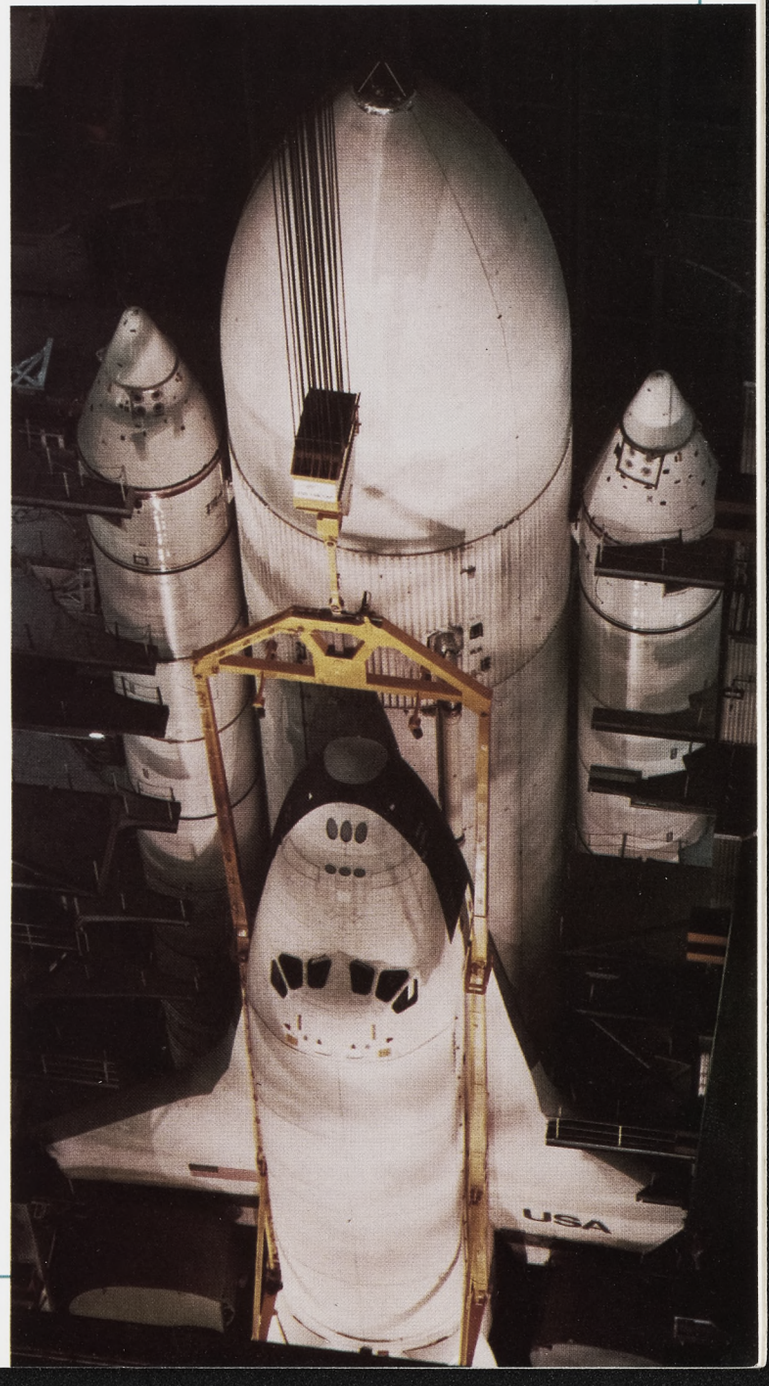
Metal from the moon can be extracted and processed cheaper in space than on Earth. "In fact," says Emile Barchichat, "MIT's publication **Technology Review** is even talking about mining asteroids between Jupiter an Mars to bring back one single asteroid which would provide $5 billion worth of building metals."

Barchichat says the experiment will be built from ordinary household items. "You would be surprised to know that things like the parts of an alarm clock, parts of a vacuum cleaner and something resembling a bicycle wheel will all be put together to accomplish the project," he says.

They will use an induction heat technique to melt the low-temperature metal and then they will use an acoustic levitation technique using sound waves to hold the metal off the sides of the cannister so that the metal formed would not be altered by its contact with another metal.

Northrop University is not alone on the Getaway Special Space Shuttle. Also on board will be such industries as Dupont, Ford, and Columbia Pictures. Its everybody's guess that Columbia Pictures is sending up some kind of camera equipment.

Stan Eilenberg, a physicist at Jet Propulsion Laboratory who is working closely with the NASA project, says a mortuary has bought space aboard the shuttle to measure the effects of zero gravity on burial in space. He adds he knows of one individual who just wanted to send up a rose bush to see what zero gravity would do to its blooms! NU



## Group Insurance Renewed

The Alumni Association has renewed the special group term life insurance program which was designed especially for our members. This policy is arranged by Moselle Insurance Inc., and underwritten by Combined Insurance Company of America. It is **Pure Term** protection, designed to insure you at the lowest premium possible and pay your beneficiary the highest cash death benefit possible. It is also, **Level Term**, which means the amount you select will maintain its full face value until you reach age 65. However, premiums increase as you get older.

All active alumni assocication members are eligible to apply for coverage. You may select a death benefit amount of $10,000 or $20,000. For a detailed brochure of information about the plan, contact the Office of Alumni Affairs, Career Center, Northrop University, Inglewood, CA 90306. No salesman will call, this is a service of your Alumni Association.

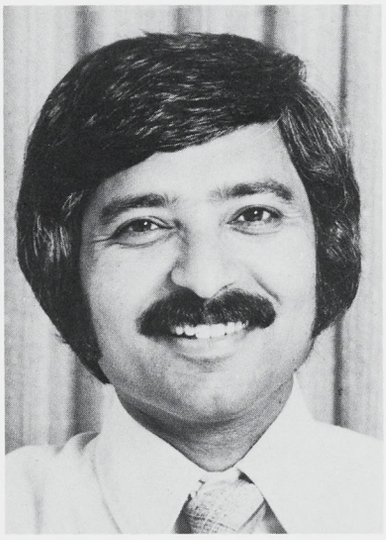
## Directory Verification Underway

Many alumni have already received telephone calls from the Harris Publishing Company, publishers of our official alumni directory. The purpose of the telephone contact is to verify the information which the alumni provided on the directory questionnaires and the information that is currently held on the alumni records.

At the same time, the telephone representatives of the publishing company are inviting alumni to purchase personal copies of the directory or place advertisng in the issue.

The directory is tentatively scheduled for release in February. If you are interested in ordering a copy and have not heard from the publisher by November 20, you may contact the publisher directly at 170 Hamilton Ave., White Plains, New York 10601.

## Majid Basy Promoted by TRW Semiconductors



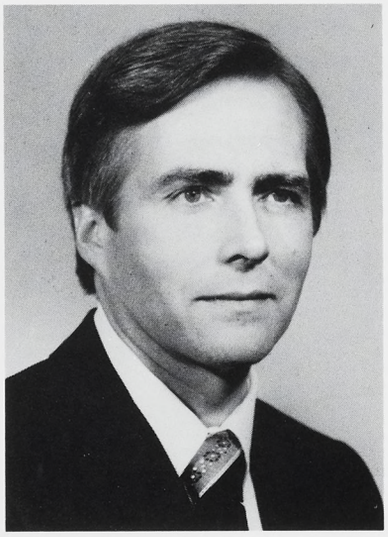
Majid Basy of Huntington Beach, has been promoted by TRW Semiconductors, a division of TRW, Inc.

Basy 39, was named as Operations Manager for the power semiconductors group. He had been diode products manager.

Basy earned an associate of science degree in electrical engineering in his native Pakistan and in 1966 joined TRW Semiconductors, where he has held a number of engineering and management posts.

He received a B.S. in electrical engineering in 1969 from Northrop University, an M.B.A. in marketing in 1974, and currently is doing graduate work in corporate finance.

## Richard Wales New Vice President of HRB—Singer



Richard L. Wales

HRB-Singer, Inc., of State College, Pennsylvania has announced the promotion of Richard L. Wales to the position of Vice President, Programs Management.

Mr. Wales is a 1960 graduate of Northrop Institute of Technology, having earned a B.S. degree in Aeronautical Engineering with an electronics major.

Mr. Wales, who has been Director, Special programs Department since 1975, joined HRB-Singer in 1962 as a Junior Engineer.

HRB—Singer is a Division of The Singer Company's Aerospace and Marine Systems Group. Headquartered in State College, PA, it is a technology-based company serving the government in the area of electronic system design and development.

**The Northrop Name** carries a lot of weight in the aviation industry as personnel rosters include many of Northrop's graduates. Pictured are recent grads (left to right) Emile Eyiolfsson '80; Richard Poole, '70; and Eli Gunnarsson, '80. all employed at Golden West Airlines. Not shown is Michael Dawn '80, who was the subject for the September issue of **Flying Magazine**

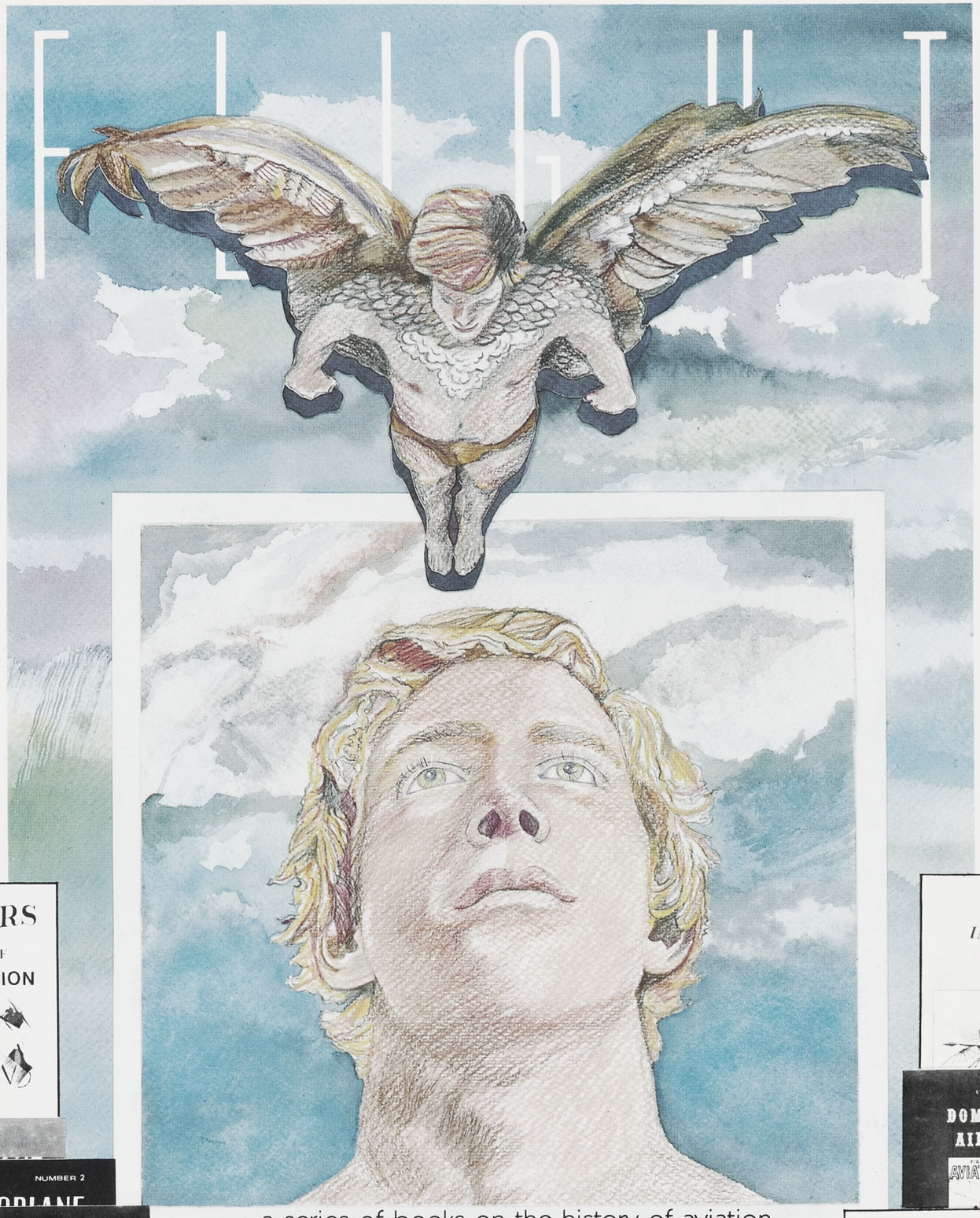
## The Alumni Board

The Alumni Board of Directors is opening up some directorships to recent graduates and making an effort to encourage members of all schools within the University to participate. The new President, Mr. Raul Alvarado has indicated that the Board meetings will provide a forum for representatives of all schools withing Northrop to exchange ideas and receive Alumni support.

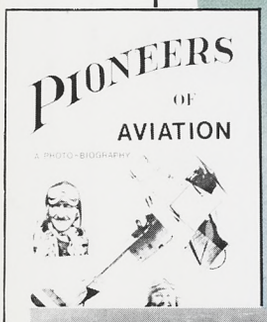
Becoming a Board member is a prestigious occurance, and Companies frequently rely upon members to open or maintain their recrutiing efforts. If you would like to attend a meeting of the Board, and perhaps become involved, please contact the Alumni Office (213) 641-3470 ext. 232, which will put you in touch with Mr. Alvarado.

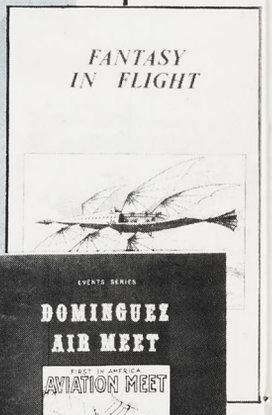
## Giving Campaign

The 1979-80 Annual Giving Campaign has received a total of $16,147.00 from a total of 259 gifts and donations of Alumni. Much of this money has been pledged to the creation of a **funded scholarship program.** The campaign will extend thru the completion of 1980, and then continue on a calendar year from now on. You will be receiving a reminder that the Alumni could use additional funds for its programs. The response has been outstanding and we wish to thank all those who have given to date. as usual we shall publish a report at the close of the campaign. Keep up the good work!




Illustration/Becky E. Beneway



...a series of books on the history of aviation

"Science, freedom, beauty, adventure: What more could you ask of life? Aviation combined all the elements I loved...I began to feel taht i lived on a higher plane than the skeptics on the ground. In flying, I tasted the wine of the gods, of which they could know nothing. **Charles Lindbergh, 1953**

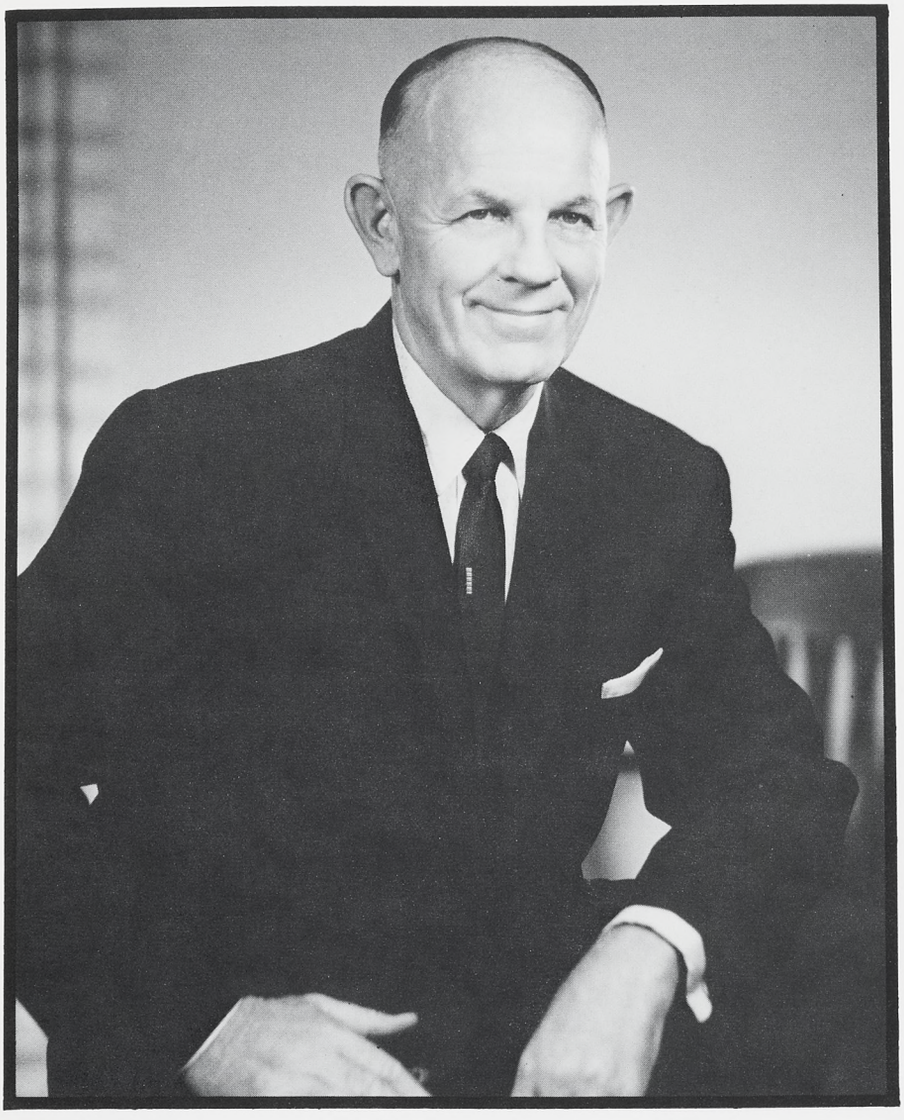
Dr. David Hatfield, aviation historian, has documented man's flight in a pictorial history from the mythological age to the 20th century.

Order blanks and detailed information available through: The Publications Office, Northrop University, Inglewood, California 90306.

**Welcome Aboard** Toasts and tributes set the tone as Chairman of the board, George Atkinson, (center) welcomes Northrop's newly appointed Deans, Welmers and Daugherty at a formal cocktail reception hosted at Northrop University. (left to right) Dr. Everett Welmers, Dean of Engineering; Dr. B.J. Shell, President; Dave Deering, V.P. Northrop Corporation and Northrop University Trustee, and Leon Daugherty, newly appointed Dean, College of Technology.

**There's Fun Just for the Pickin'** as Northrop's own Harvey Pace (A&P instructor) and his lovely wife Barbara entertained over 200 faculty, staff, and students in a University wide Bar-B-Q. Harvey and Barbara perform professionally at clubs throughout the southland and add a special highlight to many of the functions at Northrop University.

In Memoria



# Herbert J. Hartley Remembered

Herbert J. Hartley, the second President of Northrop Institute of Technology from 1961 to 1965, and one of the nations's first aeronautical educators, died at his South Laguna, California home this July. He was 76.

Dr. Hartley had served as Vice President of Northrop Institute of Technology since 1945 and was considered instrumental in the accreditation of the school's curriculum by the Engineers' Council for Professional Development in 1947.

Largely through the work of Herbert Hartley, Northrop Institute became a four year college offering a Bachelor of Science Degree in Engineering and was accredited by the Western Association of Schools and Colleges.

Considered a leader in technical education, Dr. Hartley was President of the National Council of Technical Schools, Past President of the Aviation Country Club of California and a member of the OX5 Club of the Pioneer Airmen.

# New Trustee

Mr. Deering joined Northrop University's Board of Trustees this year. David Deering is Vice President, Integrated Logistics Support, for Northrop Aircraft Division. He currently directs Northrop Aircraft's support programs for all military products including technical assistance, technical publications, training, spare parts and support equipment.

Prior to this assigment, Mr. Deering was Vice President, Iran Operations, Aircraft Group. Based in Tehran, he represented the Group Executive and his senior staff on all matters concerning the Aircraft Division, Aircraft Services Division and Northrop Worldwide Aircraft Services activities in Iran.

**David Deering**

Mr. Deering was born in Chicago, Illinois in 1924 and received his Elementary and Secondary education in Iowa. He served in the U.S.Navy from November 1942 to December 1945 as a carrier-based pilot with service in the Pacific Theater.

Mr. Deering holds a Bachelor of Science in Aeronautical Engineering from Northrop University.

# Reader Survey

Dear Nuance Reader,

This issue completes the first year of the publications of Nuance. You are one of a family of 20,000 readers from Washington D.C. to Alaska, New York to California, who are either part of the Alumni of Northrop University or a selected business within the related industries.

We hope you enjoyed the first year of Nuance and would greatly appreciate hearing from you about your reading preference. In order to better serve your interests, we would like to hear from you personally about the opinions you may have concerning Nuance. These opinions will be tabulated, compiled and released for your information in future issues. This small gesture on your part, will make a great contribution to the quality and effectiveness of Nuance.

Hope to hear from you soon.

The Nuance Staff

**Questions...**

Are you an Alumnus of Northrop University? yes ☐ no ☐
If so, what year did you graduate_____ School_____
Present Occupation _____
Are you: married ☐ single ☐
City_____ State_____
Since your date of graduation, have you been in contact with the school? yes ☐ no ☐
If so, how often? Often ☐ Seldom ☐ Never ☐ First Time ☐
What do you enjoy most about Nuance?
_____
_____

Would you like to see more emphasis placed on?
A) Alumni Profiles ☐
B) High Technology Feature Stories ☐
C) Campus News ☐
D) Class Notes ☐
E) Trustee Features ☐
F) Special Human Interest ☐
G) Other _____

Given your expertise, would you consider having an article published in Nuance?
yes ☐ no ☐
Would you pay for a subscription to this publication? yes ☐ no ☐

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A MATTER OF GROWTH TO FILL A NEED

# The President's Circle

NORTHROP UNIVERSITY

The President's Circle consists of a select group of individuals who have demonstrated their interest in the perpetuation of higher education and have invested in the future of Northrop University.

Membership in the President's Circle provides a unique vehicle for the concerned citizen to take an active part in the future of our country and the world by assuming a vital role in the life of an emerging technical university dedicated to quality and relevant private higher education.

The University solicits the participation of members possessing a keen interest in the preservation of the free enterprise system combined with the understanding of the need to assist emerging nations to promote world peace through education.

Members of the President's Circle are ambassadors of the University, sharing the Northrop story with a larger audience and keeping the University aware of the opportunities for greater service to our nation and world.

**President's Circle Members Receive:**

- Invitation to regional quarterly meetings with the President of the University to exchange views on national and international developments.
- A special certificate emblematic of membership
- Access to the University's Alumni Library and Pacific Technical Information Service in aviation and energy
- Complimentary copies of all Northrop University Press publications
- Invitation to all major campus events
- Personal Information and Important Document Locator
  This booklet, when completed by you, will provide a complete reference to all your important documents and their location. In addition, it provides for the names of your executor, accountant, broker, doctor and rabbi or clergyman. This document locator will be invaluable to close family members and loved ones in the future.

Membership is open to alumni or by invitation to other individuals who make an annual tax-deductible donation of $1,000 or more to the President's Development Fund of Northrop University. (Donations may be made in cash, stock or property. Membership is renewable annually.)

**PRESIDENT'S CIRCLE**

I support the goals and objectives of Northrop University and the ideals of the free enterprise system.

☐ Enclosed is my check, in the amount of $ _____
for my Annual Membership in the President's Circle.

☐ Please contact me regarding a gift other than cash.

☐ Please contact me about other ways I may assist in the development of Northrop University.

Name _____

Address _____

City / State / Zip _____

Phone (____) _____

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